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Forest Service, United States Department of Agriculture

ALLEGHENY FOREST EXPERIMENT STATION*

FOREST SERVICE
ROCKY MOUNTAIN FOREST & RANGE EXP. STATION
FORT COLLINS, COLORADO
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DEER DAMAGE TO PINE REPRODUCTION IN SOUTHERN NEW JERSEY

Foresters acquainted with conditions in southern New Jersey know that the large deer population is a real menace to the survival of planted stock; but they have not stressed the damage to natural reproduction from browsing by deer. That game constitutes a major source of revenue in this state, no one will deny; yet both the silviculturist and the game manager should be cognizant of the relationship involved between tree regeneration and deer. To supplement other reproduction studies, a study of deer damage was undertaken on the Lebanon State Forest in the hope that any differences in susceptibility among the various species and sizes would be revealed. Naturally data gathered here are only indicative of conditions found on this area of the Oak-Pine Type; similar studies in other sections of the same type are needed before generalizations may be made.

On an area of approximately 4 acres, one hundred and ninety-six 1/100-acre plots were temporarily established at fixed intervals. Table 1 summarizes the tally of reproduction by species, height classes, and damage classes. "Uninjured" trees included all those not browsed. "Lightly-injured" trees were those having one or more twigs eaten off, provided the terminal shoot was not lost or the tree seriously deformed. "Heavily-injured" trees were those with the leader browsed and otherwise so damaged as to present an irregular, stunted appearance. Naturally the same amount of browsing on a small tree was more serious than it would be on a large one.

Table 1 shows the relative difference in susceptibility of the three species to deer damage. In spite of this selective browsing, two-thirds of the Virginia pine seedlings were unharmed, but only one-third of the pitch pine. The shortleaf reproduction was intermediate with 50% unharmed. The data in the table were analyzed by Snedecor's** method for the analysis of variance in the case of disproportionate frequencies in the classes of observations. Significant differences resulted from comparisons between all pairs of species and, in most cases, between pairs of height classes. As one would suppose, the percentage of lightly-injured seedlings is very low in the 0-0.5' class, as any browsing in trees of this size would tend to be severe. Above 3.5' in height, few seedlings were damaged, and those were chiefly in the lightly-injured class. The percentage of heavily-injured reproduction tends to decrease with increase in the height of the seedlings.

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Silas Little, Jr.
Junior Forester

October 25, 1937.

* Maintained at Philadelphia, Pa., in cooperation with the University of Pennsylvania.

**Snedecor, George W. 1934. Calculation and interpretation of analysis of variance and covariance. 96 pp. Collegiate Press, Inc., Ames, Iowa.

Table 1

Number and Percentages of Seedlings in Damage Classes in Relation to the Total Number in Height Classes

Height Classes	Damage Classes	Species							
		Pitch Pine		Shortleaf Pine		Virginia Pine		Total	
Feet		No.	%	No.	%	No.	%	No.	%
0-0.5	U	22	38.6	34	44.7	18	81.8	74	47.8
	L	9	15.8	7	9.2	-	-	16	10.3
	H	26	45.6	35	46.1	4	18.2	65	41.9
	Total	57	100.0	76	100.0	22	100.0	155	100.0
0.6-1.5	U	51	28.5	41	40.2	19	55.9	111	35.2
	L	44	24.6	18	17.6	6	17.6	68	21.6
	H	84	46.9	43	42.2	9	26.5	136	43.2
	Total	179	100.0	102	100.0	34	100.0	315	100.0
1.6-2.5	U	1	4.3	10	43.5.	16	50.0	27	34.6
	L	10	43.5	6	26.1	14	43.8	30	38.5
	H	12	52.2	7	30.4	2	6.2	21	26.9
	Total	23	100.0	23	100.0	32	100.0	78	100.0
2.6-3.5	U	10	30.3	17	54.8	13	65.0	40	47.6
	L	17	51.5	8	25.8	6	30.0	31	36.9
	H	6	18.2	6	19.4	1	5.0	13	15.5
	Total	33	100.0	31	100.0	20	100.0	84	100.0
3.6-4.5	U	16	57.1	15	93.8	15	88.2	46	75.4
	L	10	35.7	1	6.2	-	-	11	18.0
	H	2	7.2	-	-	2	11.8	4	6.6
	Total	28	100.0	16	100.0	17	100.0	61	100.0
4.6-0.6" (D.B.H.)	U	27	60.0	20	74.1	13	92.9	60	69.8
	L	17	37.8	7	25.9	1	7.1	25	29.1
	H	1	2.2	-	-	-	-	1	1.1
	Total	45	100.0	27	100.0	14	100.0	86	100.0
Total	U	127	34.8	137	49.8	94	67.6	358	46.0
	L	107	29.3	147	17.1	27	19.4	181	23.2
	H	131	35.9	91	33.1	18	13.0	240	30.8
	Total	365	100.0	275	100.0	139	100.0	779	100.0

U - Uninjured
L - Lightly injured
H - Heavily injured